

## Chapter 6

### WATER DEMAND MANAGEMENT PROGRAM

The City of Santa Cruz has had a long-standing commitment to water conservation and offers a variety of programs, informational materials, and incentives to help city water customers become more water-efficient. This section describes the water demand management measures (DMMs) currently being implemented by the City and discusses the planning process underway to guide water conservation activities over the next ten years.

#### 6.1 Overview

The City of Santa Cruz has long recognized the importance of conserving water as a responsible water management strategy to help protect the area's natural resources, to stretch existing water supplies, to help downsize and/or delay the need for costly additional water supply, treatment, and distribution upgrades, and to fulfill the City's overall goal of ensuring a safe, reliable, and adequate water supply. Water conservation represents one of three basic components of the City's Integrated Water Plan. In essence, water conservation involves making or inducing changes to many small end uses that individually have minimal effect on overall water use, but that collectively can constitute significant aggregate reductions in system demand.

The Water Conservation section is responsible for promoting efficient water use and implementing management practices that reduce customer demand for water. Its responsibilities and major activities fall into the following four general categories:

Public Awareness and Education: to promote public awareness and education about the City's water resources and the importance of water conservation; and to provide timely and accurate information to utility customers and the general public about conservation practices and technologies, as well as the City's conservation programs and policies.

Water Demand Monitoring: to monitor water production, consumption and system water losses; to track weather and population data; to evaluate trends in per capita water use; to track demand associated with new service connections; to compare actual water demand with projected use by customer category; and to develop and maintain water demand forecasts for the water service area for use in supply planning.

Long-Term Water Conservation Programs: to develop and implement various conservation projects and programs that result in a sustained reduction in customer water demand; to track water savings from ongoing conservation programs; and to evaluate the need for program modifications to improve efficiency, customer service, and water savings in keeping with conservation goals.

Planning and Emergency Management: to periodically update and implement the City's Water Shortage Contingency Plan and the Urban Water Management Plan, and to assist in Departmental and City-wide emergency planning and management activities.

Over the last decade, the Water Conservation section's priorities and work plan have been guided by two principal documents: 1) *Memorandum of Understanding Regarding Urban Water Conservation in California* (MOU), and 2) the Department's Long-Term Water Conservation Plan.

In June 2001, the City of Santa Cruz became a signatory to the [MOU](#) and joined the [California Urban Water Conservation Council](#) (CUWCC) in promoting water conservation locally and statewide. By becoming a signatory, the City committed to implementing all 14 urban water conservation Best Management Practices (BMPs) contained in the MOU deemed to be locally cost-effective and to periodically report progress made to the CUWCC.

The other guiding document was a 10-year, Long-Term Water Conservation Plan adopted by the City in 2000 (Gary Fiske & Assoc. 2000). The Long-Term Water Conservation Plan identified 17 demand reduction programs (some of which overlapped with those contained in the MOU) to implement over a period of ten years, including:

- Toilet, urinal replacement (residential, commercial)
- High efficiency clothes washers
- Showerhead, faucet aerator distribution program
- Plumbing fixture retrofit regulations
- Residential, commercial water audits
- Large landscape water audits, budget-based rates

It was estimated that, when fully implemented in 2010, the plan would lessen water demand on an ongoing basis by approximately 282 million gallons per year, equal to about 0.8 mgd, and that residential water use per capita would be reduced from 76 to 65 gpcd. Actual savings achieved through long-term conservation measures was closer to 251 million gallons, almost 90 percent of the City's goal. Residential per capita water

use in 2010, though, measured 56 gpcd, 14 percent lower than anticipated at the end of the 10-year timeline. The planning horizon for the Department's current Long-Term Water Conservation Plan has recently ended and is in the process of being reevaluated. Effectively, the City's demand management program addresses every major end use of water in every major customer sector (residential, commercial, and landscape), with emphasis on measures that: 1) are quantifiable, 2) make a lasting reduction in average daily water use, 3) provide the greatest water savings, 4) are socially acceptable, and 5), have widespread appeal to the City's water customers.

The City's water conservation program is funded by a combination of water rates, system development charges, and miscellaneous service fees.

In 2008, the City received statewide recognition for its water conservation activities in being selected for the *Llana Sherman Excellence Award for Local/Community Innovations* from the California Urban Water Conservation Council.

## **6.2 Recent Accomplishments**

The Water Conservation Office continues to build upon a range of services promoting water use efficiency. Since completion of the 2005 Urban Water Management Plan, accomplishments of the Water Conservation Office include:

- Developed and implemented the H<sub>2</sub>ome Water Survey program for residential customers;
- Initiated landscape water conservation programs including large landscape water budgets and water use reports, turf removal rebates, and rain barrel sales;
- Developed a Water-Smart Gardening database, website, and cd in collaboration with other area water agencies;
- Updated the City's Water Efficient Landscape Ordinance with stricter standards;
- Completed water demand modeling and analysis study to determine impacts of weather, rates and rate structure, and conservation on consumption trends;
- Developed and implemented a Meter Testing, Repair, and Replacement Policy;
- Implemented commercial water audits through the Monterey Bay Area Green Business program;
- Participated in a statewide water conservation rebate program for commercial, industrial, and institutional customers;
- Distributed free water conservation cards to all local hotels and restaurants;
- Implemented and enforced outdoor water use restrictions in 2007 and 2009;

- Installed new software to track water waste and water restriction violations;
- Undertook a comprehensive review and update of the City's Water Shortage Contingency Plan;
- Developed and codified Santa Cruz Municipal City Code Chapter 16.01, Water Shortage Regulations and Restrictions Ordinance;
- Amended the Santa Cruz Municipal Code to facilitate graywater use; and
- Participated in a comprehensive water audit of the University campus and assisted the University in implementing selected high priority water conservation projects.

### **6.3 Description of Demand Management Measures**

Water Code section 10631(f) (1) requires water suppliers to:

*“Provide a description of each water demand management measure that is currently being implemented, or scheduled for implementation.”*

The Water Code then lists a series of fourteen DMMs for the supplier to address in the order in which they formerly were organized as BMPs in the MOU.

As a signatory to MOU, the Water Conservation Office operates water conservation programs in accordance with the BMPs. The MOU and BMPs were revised and restructured by the CUWCC in 2008. The 14 BMPs are now organized into five categories. Two categories, Utility Operations and Education Programs are considered “Foundational” BMPs because they are considered to be essential water conservation activities by any utility. The remaining BMPs are designated as “Programmatic BMPs” and are organized into Residential, Commercial, Industrial, and Institutional (CII), and Landscape categories. The relationship between the BMPS as organized by the CUWCC and the DMMs listed in the Water Code is shown in Table 6-1.

A detailed description of each DMM that the City is currently implementing follows, in the order that they are listed in the MOU.

### **6.4 Utility Operations Programs**

#### **6.4.1 Operations Practices**

This BMP encompasses three elements that utilities take to facilitate conservation program implementation, supplement incentives with regulation, and, where applicable, develop programs with their wholesaler agency's assistance.

**Table 6-1. Comparison of California Urban Water Conservation Council BMPs and the Urban Water Management Plan DMMs**

CUWCC BMP Organization and Names (2010 MOU)				UWMP DMMs	
Type	Category	BMP #	BMP Name	DMM #	DMM Name
Foundational	Utility Operations Programs	1.1.1	Conservation Coordinator	L	Water conservation coordinator
		1.1.2	Water Waste Prevention	M	Water waste prohibition
		1.1.3	Wholesale Agency Assistance Programs	J	Wholesale agency programs
		1.2	Water Loss Control	C	System water audits, leak detection, and repair
		1.3	Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections	D	Metering with commodity rates for all new connections and retrofit of existing connections
		1.4	Retail Conservation Pricing	K	Conservation pricing
	Education Programs	2.1	Public Information Programs	G	Public information programs
		2.2	School Education Programs	H	School education programs
Programmatic	Residential	3.1	Residential assistance programs	A	Water survey programs for single-family residential and multifamily residential customers <sup>1</sup>
				B	Residential plumbing retrofit
		3.2	Landscape water survey	A	Water survey programs for single-family residential and multifamily residential customers <sup>1</sup>
		3.3	High-Efficiency Clothes Washing Machine Financial Incentive Programs	F	High-efficiency washing machine rebate programs
	3.4	WaterSense Specification (WSS) toilets	N	Residential ultra-low-flush toilet replacement programs	
	Commercial, Industrial, and Institutional	4	Commercial, Industrial, and Institutional	I	Conservation programs for commercial, industrial, and institutional accounts
	Landscape	5	Landscape	E	Large landscape conservation programs and incentives

<sup>1</sup> Components of DMM A (Water survey programs for single-family residential and multifamily residential customers) applies to both BMP 3.1 (Residential assistance program) and BMP 3.2 (Landscape water survey)

### 6.4.1.1 Water Conservation Coordinator

The City of Santa Cruz has employed a full-time water conservation coordinator since 1986. The current Water Conservation Manager is responsible for planning, organizing, and directing the operations of the Water Conservation section and for reporting on BMP implementation.

The Water Conservation Manager meets regularly with the Water Director and senior managers to coordinate conservation activities with the administration, engineering, production, distribution, and customer service sections.

The Water Conservation section is staffed with one Environmental Projects Analyst, and two Water Conservation Representatives who operate existing programs and assist with new program development.

### 6.4.1.2 Water Waste Prevention

Under the MOU, water waste prevention consists of enacting, enforcing, or supporting legislation, regulations, ordinances, or terms of service that prohibit water waste in new development and by existing users, or that facilitate implementation of water shortage response measures.

The City's water conservation ordinance ([Santa Cruz Municipal Code 16.02](#)) has been in operation since 1981 and was updated in 2003. Under the ordinance it is unlawful for any person to use water for any of the following:

- unauthorized use of water from a fire hydrant,
- watering of landscaping in a manner or to an extent that allows excess water running off the property,
- once notified, allowing plumbing leaks to go unrepaired,
- outdoor washing of structures, vehicles, or surfaces without the use of an automatic shut-off nozzle, and
- operation of a fountain unless water is recycled

*An example of excess water running to waste from landscape irrigation system*



Provisions of the ordinance regulating new development include prohibitions on:

- The use of water in new ice-making machines and any other new mechanical equipment that utilizes a single pass cooling system to remove and discharge heat to the sanitary sewer,
- washing of vehicles at a commercial car wash unless the facility utilizes water recycling equipment
- the use of water for new non-recirculating industrial clothes wash systems, and
- the use of potable water for dust control or soil compaction purposes in construction activities where there is a reasonably available source of reclaimed water appropriate for such use

The ordinance is in effect at all times. However, during mandatory water restrictions, violating the water waste ordinance is punishable by a fine levied on the utility bill. During curtailment, an increased number of staff patrol and enforce restrictions, including water waste violations, seven days per week.

The Water Conservation Office has a designated phone number for customers to report water waste (831-420-LEAK). Customers may also submit an online form found on our website. When water waste is observed, site visits, in-person customer contact, phone, and/or mail correspondence is used to resolve the issue. Field staff will increase drive-by checks of sites receiving water waste complaints to help ensure the issue was resolved. New software was acquired in 2009 to help document, track and manage water waste complaints, including the photo evidence of water waste incidents.

In addition, the City has a comprehensive landscape water conservation ordinance ([Santa Cruz Municipal Code 16.16](#)) to ensure landscapes and irrigation systems in new and renovated development are designed to avoid runoff, overspray, low-head drainage and other similar conditions where water flows off site onto adjacent property.

Refer to Chapter 8 for a discussion of the City's water shortage response measures.

#### **6.4.1.3 Wholesale Agency Assistance Programs**

The City of Santa Cruz currently is not a wholesale water supplier nor does it receive water from a wholesale agency. This demand management measure does not apply.

## 6.4.2 Water Loss Control

As mentioned in section 4.4, the Water Conservation Office has conducted an annual water audit of the City's water distribution system since 1997 using the approach described in the AWWA M36 "Manual of Water Supply Practices". The purpose of the audit is to quantify how much water and revenue is lost through physical leaks and apparent losses and to identify steps to minimize system losses and improve the operational efficiency of the water system. Beginning in 2006, the City also began to use the water balance approach developed through the International Water Association (IWA), now advocated by AWWA, to better characterize water losses in the distribution system.

Water audit results indicate average system water loss from 2001 to 2010 is approximately 7.5 percent of total water production. Of this amount, it is estimated that 5 to 6 percent is lost due to physical leakage in the distribution system, and another 1 to 2 percent is not physically lost but goes uncaptured on the billing system due to sales meter inaccuracies. In 2010, the Water Department adopted a new Meter Testing, Repair, and Replacement Policy that accelerates large meter replacement and should help improve overall meter accuracy.

*Water distribution crews working on system leak repair*



To address physical leakage, service line repairs, leak repairs, and line replacements occur on an ongoing basis. The City has a multi-year service line replacement program to eliminate all polybutylene service lines, which was a widely used material between the early 1970s and the late 1980s until it was found to be defective. To date, 5,442 or over half of all polybutylene service lines on the system have been replaced with copper lines.

Although a formal leak detection program is currently not in place, the Water Department uses sonic leak detection equipment to locate and repair leaks in the water system. In addition, the Department monitors for leaks on the customer's side of the meter by reviewing exception reports for high meter readings. Customers are notified so they can take appropriate action to repair leaks, even before they receive their water

bills. In 2010, the City’s top irrigation customers began receiving Water Use Reports in which customers, property managers and landscapers can see their irrigation usage including unexpected spikes due to leaks. Because these reports are sent to vested multiple parties for each property, there is an increased opportunity and incentive to notice and repair outdoor leaks in a timely manner.

### **6.4.3 Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections**

All of the City’s 24,351 water connections are fully metered with Automated Meter Reading (AMR) technology. Water meters are required for all new service connections. In addition, a separate, dedicated irrigation meter is required for all new and renovated multi-family and commercial landscape projects with over 5,000 square feet of landscaped area.

All customers are billed according to the volume of water consumed. Inside-City customers, large volume accounts, and irrigation accounts now are all billed on a monthly basis<sup>1</sup>. Monthly billing was instituted in 2005 mainly to facilitate rising rates for all City utilities, but it also serves to aid in leak detection and allows for more accurate monitoring of individual account usage and categorical water consumption. Most outside City customers are still billed on a bimonthly basis.

In 2010, the Water Conservation Office also initiated an effort to examine the feasibility of retrofitting mixed-use commercial accounts that have substantial irrigation demands with their own dedicated landscape meter. In all, almost 1,900 commercial properties were analyzed, resulting in 152 potential commercial candidates for retrofitting. This effort is expected to take another year or two to complete.

### **6.4.4 Retail Conservation Pricing**

The Customer Service section, also referred to as “Santa Cruz Municipal Utilities” provides customer service and handles utility billing for water, sewer, refuse, and recycling services to the residents and businesses of the City of Santa Cruz, and services for water only to the unincorporated surrounding areas and part of the City of Capitola. The water portion of the City’s utility bill consists of three components: 1) a fixed monthly “readiness-to-serve” charge, 2) a volumetric charge, and 3) for customers

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<sup>1</sup> Monthly billing was instituted for all inside City customers beginning in 2005 and for all outside City irrigation customers in 2010.

residing in elevated pressure zones, an elevation charge applies. The readiness to serve charge varies by meter size and location (Table 6-2).

**Table 6-2. Readiness to Serve Charges (2011)**

Meter Size	Inside City Monthly	Outside City bimonthly
5/8 and 3/4"	\$17.41	\$44.40
1"	\$43.52	\$111.00
1.5"	\$87.05	\$221.96
2"	\$139.27	\$355.14
3"	\$261.14	\$665.90
4"	\$435.23	\$1,109.84
6"	\$870.46	\$2,219.66
8"	\$2,002.05	\$5,106.68
10"	\$2,472.09	\$6,303.84

For the volumetric charges, the City has had a multi-block, inclining rate structure in place for single family residential customers since 1995. In 2004, following a comprehensive water rate study, a new, five-tier rate structure was adopted that applies to residential accounts with either one or two dwelling units. This new rate structure was intended to encourage more efficient use by single family residential and two-unit customers during the peak summer season, when the system relies more heavily on reservoir storage to meet daily demands. The rates effective January 2011 are listed in Table 6-3. For all other customers, including multi-family (3 or more dwelling units), business, industrial, municipal, and irrigation customers, water is billed at a uniform rate corresponding with Block 2.

**Table 6-3. Single Family and Two-Unit Residential Water Rate Structure (2011)**

Block	Category	Inside City monthly		Outside City bimonthly	
		Units (ccf)	Rate	Units (ccf)	Rate
5	Inefficient or excessive use	over 18	\$8.79	over 36	\$11.21
4	High use	15-18	\$7.05	29-36	\$8.98
3	Average outdoor needs	10-14	\$5.14	19-28	\$6.55
2	Average indoor needs	5-9	\$4.00	9-18	\$5.10
1	Essential needs	1-4	\$1.57	1-8	\$2.00

In addition to changing the rate structure, the overall cost of water service was increased annually for all customers over a period of six years beginning in mid-2004<sup>2</sup>. The primary purpose of this phased rate increase was to fund over \$100 million in capital improvements that were identified in the rate study to maintain and enhance the integrity of the water system. All utility rates are established by resolution of the City Council.

#### **6.4.4.1 Impact of Rate and Rate Structure Changes on Water use**

Over a three year period from 2006 through 2008, after the change to the new five-tier rate structure and as the annual rate increases were being phased in, overall water consumption steadily declined. The City later contracted with Weber Analytical to update its water demand models and to explore the recent trends to understand how much of the observed decline was due to weather effects, pricing changes, or other conservation influences. The modeling showed, after controlling for weather influences, an overall reduction in water use of 1.1 mgd or 12 percent was experienced as compared to the 5-year period from 1999-2004, when consumption was relatively steady. The decline was seen in every customer category, to varying degrees. The overall decline was strongly related to the combined price impact from the five-tier structure and the sharply higher rates for water service and by 2008 had reached a new equilibrium. Future price increases are expected to be more in line with inflation and should have smaller effects on sales volume.

#### **6.4.4.2 Conservation Pricing Redefined**

In 2007, the CUWCC amended the BMP for retail conservation pricing. The current definition states that “*conservation pricing provides economic incentives (a price signal) to customers to use water efficiently*” and sets as one option a minimum percentage of water sales revenue from volumetric rates of 70 percent. Rather than focus on the type of rate design, such as uniform, tiered, seasonal, or allocation-based, all of which are considered potentially consistent with the above definition, emphasis was placed on minimizing fixed charges and maximizing the amount of water sales revenue from volumetric rates.

In both 2007 and 2008, the City’s ratio of volumetric revenue to total revenue was 71 percent, consistent with the CUWCC’s new definition. Ironically, the water restrictions implemented in 2009 led to a decline in both sales volume and volumetric revenue such

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<sup>2</sup> The final 5% rate increase originally scheduled to be effective January 2009 was deferred until January 2011.

that the City conserved its way out of compliance with BMP 11. So even though the current rate structure and accompanying rate levels clearly achieved one of the City goals to encourage more efficient use and initially met the City's commitment under the MOU, the level of volumetric revenue over the last few years (67 to 68% of total revenue) technically does not satisfy the requirements in the MOU regarding retail water conservation pricing.

#### 6.4.4.3 Budget–Based Rates for Large Landscape Accounts

The City's Long-Term Water Conservation Plan included moving to budget-based rates for large landscape customers. While water budgets have been developed for large landscape customers, utility billing system constraints have precluded implementing budget-based billing for the time being. The City still intends to pursue budget-based water rates for large landscape customers, including parks, golf courses, business and residential irrigation accounts in the future.

### 6.5 Education Programs

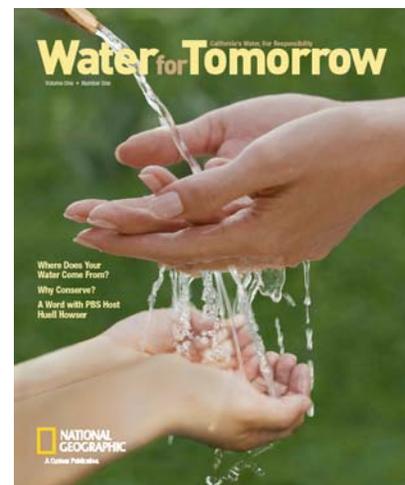
#### 6.5.1 Public Information Programs

The City of Santa Cruz Water Department actively promotes public awareness and education about the City's water resources and the importance of water conservation. The Water Department regularly makes contact with the public through the news media, in addition to keeping its website continuously updated.

Specifically, public information is disseminated using the following media and methods:

- Utility Newsletter, called the "SCMU Review", which includes news and information on water conservation topics;
- [Water Conservation website](#);
- Public meetings and speaking events to community organizations, industry and homeowners associations, and service groups;
- Tabling at local fairs, farmers markets, and events;
- Distribution of free water conservation brochures and literature;

*Free literature available from the  
Water Department*



- Paid advertising in local newspapers;
- Opinion page coverage
- Bill inserts;
- Messages and information on customer's bills showing use in gallons per day and a graph charting monthly/bimonthly water use for the entire year;
- Distribution of free conservation devices, including showerheads, faucet aerators, leak detection tablets, shower and hose timers, hose nozzles, gardening cds, and literature;
- Water supply tours;
- Marketing and advertising of EPA's "Fix a Leak Week";
- Television and radio news interviews and community television programs;
- Participation in regional water forums;
- Participation with other local water agencies in local events and sponsorships of water conservation-related activities;
- Subsidized sale of rain barrels;
- Free workshops on irrigation efficiency, new irrigation technologies, and water conservation strategies for the landscape; and
- Financial support to the Green Gardener Program, California Water Awareness Campaign, Water-Smart Gardening Faire, Green Business Program, and the Water Education Foundation.

*New logo reflects City's water conservation ethic:*



The Water Conservation Office also issues a formal water supply outlook three times a year between late winter and spring to update the public on local water conditions and to provide information water supply availability for the year ahead. Weekly updates of water conditions, including rainfall, runoff, and reservoir levels are posted on the City's website throughout the year.

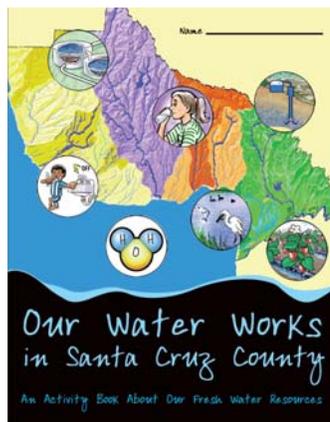
Refer to section 5.7.4 for a description of public outreach activities related to the City's desalination program.

### **6.5.2 School Education Programs**

The City offers school education activities for students ranging from upper elementary age children up to the University level. The program gives students an opportunity to learn about the City's water supply system and water conservation. School educational activities include:

- Field trips and ranger presentations at Loch Lomond Reservoir;
- Distribution of age and grade level appropriate curriculum and educational materials, including a water education booklet specially developed for Santa Cruz County students;
- Classroom presentations; and
- High School Watershed Academy program;

*Examples of water education materials for local schools:*



Implementing school educational programs has become more challenging in recent years. Education budget cuts have made it difficult for schools to arrange for bus transportation and increased demands in mandated curriculum requirements have left little room for additional lesson plans and extracurricular activities.

## 6.6 Residential Programs

Residential water use comprises almost two thirds of system consumption and therefore is a main focal point of the City's water conservation efforts.

### 6.6.1 Residential Assistance Programs

This BMP, as it is currently written in the MOU, focuses on indoor residential water use efficiency and consists of leak detection assistance, water efficiency suggestions, an inspection, and providing showerheads and aerators meeting WaterSense specifications.

The City currently offers a **H<sub>2</sub>ome Water Survey** program to both single-family and multi-family customers. As part of the survey, Water Conservation staff reviews water consumption and billing information with the customer; teaches how to read the meter and how to use it to detect household leaks, inspects home plumbing fixtures, and offers free showerheads and aerators. The primary emphasis of the City's H<sub>2</sub>ome Water Survey program is in assessing outdoor water use and providing water saving recommendations through a landscape water survey (See Section 6.6.2, below). Many of the materials provided during the survey, however, including a meter reading log,

handouts on leak detection and repair, and leak detection tablets are intended to assist residential customers consistent with this BMP.

The City previously implemented, as part of its Long-Term Water Conservation Plan, a one-time Water Conservation Kit Distribution Program to all of its roughly 18,000 single family residential customers. This program involved door-to door distribution of low-flow showerheads, faucet aerators, a garden hose nozzles and leak detection tablets, along with instructions, conservation literature, and toilet and washer rebate brochures to encourage further action and water savings. Funds remaining at the end of the program were used to offer the same materials to multifamily households on request.

Currently, the Water Conservation Office stocks and offers free 2.0 gpm showerheads, 1.5 gpm lavatory faucet aerators, kitchen aerators, hose nozzles, toilet dye tablets, and hose timers on request to any interested water customer. In addition, the City offers leak detection gel to large building managers such as property management companies, motels, and apartment owners to assist them in detecting and repairing leaks in toilets and urinals.

Refer to section 6.6.4 below for the City's retrofit requirements for showerheads at time of sale.

### **6.6.2 Landscape Water Survey**

The City's Home Water Survey program was begun in 2006 to provide site-specific assistance to residential customers with large landscaped areas and high outdoor water demands. These customers tend to have automatic irrigation systems and their summer usage often extends into the top billing tiers.

With the property owner present, a conservation representative analyzes the customer's utility bill, evaluates the existing landscaped area, design, and the types of plant materials in place, and checks the irrigation system. Each irrigation station is run and evaluated for flow rate, coverage, and problems such as runoff, overspray, uneven distribution, and broken or leaking equipment. For turf areas, a catch can test is run to determine sprinkler output and uniformity. The customer receives a list of site-specific recommendations to help conserve water both inside and outside the home. An irrigation schedule tailored to the customer's landscape is also provided. Customers are given training on how to operate their irrigation controllers, including the use of water-saving features and scheduling strategies to reduce runoff. Water saving devices

including hose nozzles and hose timers are offered at no cost. Any applicable rebate information and water conservation literature is also provided.

The H<sub>2</sub>ome Water Survey program is voluntary and made available to all interested residential customers. The program is marketed, however, mainly to the top 20 percent of all residential users. Customers with unusually high summer water use and high water bill referrals from customer service are also invited to participate in a survey. Marketing methods include direct mail, brochures, and promotion in the utility newsletter and website. On average, the City performs about 100 surveys a year, primarily during the summer months, but participation varies widely from year to year depending on customer interest level and staff availability.

### 6.6.3 High Efficiency Clothes Washers

Clothes washing is one of the major end uses of water in the residential sector. It is also one where there is very significant water conservation potential in terms of the opportunity to reduce per capita water use on a long-term basis. To this end, the City offers its residential customers a \$100 rebate for purchasing an Energy Star labeled, High-Efficiency Clothes Washer (HECW), and processes between 500 and 700 HECW rebates annually. Over 6,200 clothes washer rebates have been issued since the program began in 2000. Over time, the average water factor (gallons of water per load per cubic foot of capacity) of appliances on the market has steadily declined and the equipment become increasingly more water efficient. In 2010, the average water factor of the 710 HECWs rebated by the City was less than 4.0. As water factors continue to decrease, future water savings from HECW installations will continue to improve.

*High efficiency clothes washer*



The City works with local appliance retailers to promote the program at local retail outlets in coordination with residential clothes washer rebates concurrently offered by PG&E. The Water Conservation Office also markets the HECW program through newspaper ads, the City's website, the utility newsletter, and the H<sub>2</sub>ome Water Survey program.

### 6.6.4 WaterSense Specification Toilets<sup>3</sup>

Toilets are another area where there is a significant potential for long-term reduction in per capita water use in the residential sector. The City's residential toilet replacement program has two components: a rebate program and a plumbing fixture retrofit regulation.



The City has operated a rebate program to promote the installation of ultra-low-flush (ULF) toilets in residential accounts since 1995. The program originally featured a \$75 rebate as a financial incentive for customers to remove their, older, higher-volume toilets and replace them with 1.6 gallon per flush toilets. In 2007, the City began to also offer a \$150 rebate for 1.28 gallon per flush toilets, also referred to as High Efficiency Toilets (HETs). The \$75 rebate was discontinued in 2010. The City now only rebates toilets meeting WaterSense specifications with a maximum flush volume of 1.28 gallons. Over 11,000 residential toilets have been replaced under this rebate program.

In 2003, the City adopted a plumbing fixture retrofit ordinance. This regulation requires that all residential, commercial, and industrial properties be retrofitted with low consumption showerheads, toilets, and urinals when real estate is sold. As part of the initial program implementation, the City worked closely with the County of Santa Cruz and the City of Capitola to have similar ordinances passed in these other jurisdictions. As a result, the retrofit regulation applies uniformly throughout the entire water service area, regardless of jurisdiction. This ordinance implements the City's Long-Term Water Conservation Plan and fulfills the City's obligation under the MOU to carry out a toilet replacement program that is "at least as effective as requiring toilet replacement at time of resale."

Under the law, the seller of the property is responsible for retrofitting any older toilets, urinals, and showerheads on the property with low consumption fixtures, and for obtaining a water conservation certificate from the Water Department. There is an option in the ordinance that allows the responsibility for retrofitting to be transferred from the seller to the buyer, if both parties agree. In either case, the City tracks real estate sales and requires every property to be inspected to verify that the plumbing fixtures on the property being sold meet the low consumption standards. A custom database program was developed by a consultant to manage property sales data on local properties and retrofitting records, as well as follow-up enforcement of the ordinance.

<sup>3</sup> The [WaterSense specification](#) refers to toilets that use 20 percent less water than the current federal standard and are certified by independent laboratory testing to meet rigorous criteria for both performance and efficiency.

Since 2003, the City has processed, inspected, and certified almost 6,500 individual properties, 95 percent of which are single or multi-family residential accounts, and verified over 12,900 residential toilets and almost 11,300 showerheads meet low consumption standards. However, since 2008, inspection and enforcement activity has been less than half it was in the first several years, reflecting depressed housing turnover both locally and nationally.

The flush volume standard for the retrofit ordinances continues to be 1.6 gpf. However, many subject to these ordinances are now choosing to install HETs instead of 1.6 gpf fixtures because of their widespread availability on the market and superior performance. By 2014, only HETs will be available for sale under California law.

## **6.7 Commercial, Industrial and Institutional (CII) Programs**

The City provides water to over 1,900 commercial and industrial accounts within the service area, which together represents about 26 percent of total system water use. The City offers several programs to encourage commercial customers to become more water efficient by using water-saving technology. These include

- Smart Rebates Program
- Monterey Bay Area Green Business Program
- City-administered Rebates
- Plumbing Fixture Retrofit Regulations

Smart Rebates is a statewide, one-stop program administered by the California Urban Water Conservation Council that offers a wide-ranging list of measures for conservation product and appliance rebates. The program is funded jointly with a statewide Proposition 50 grant and with participating water agency contributions. The City partnered in 2007 with the CUWCC to offer a variety of rebate options to CII customers. They are:

- High-Efficiency Clothes Washer: \$400
- High-Efficiency Toilet: \$200
- High-Efficiency Urinal: \$300
- Pressurized Waterbroom: \$50
- X-Ray Film Processor Re-Circulation System: \$2,000
- Cooling Tower Conductivity Controller: \$1,200

The Water Conservation Office markets the Smart Rebates program on the website, during CII surveys, and to CII customers that stop by the counter. Customers may opt to participate in City administered rebate programs, although the City rebate amounts are not as high. Major participants in this program have included the Santa Cruz Beach Boardwalk, the University, and various hotels and restaurants.

[The Monterey Bay Area Green Business Program](#) This program is a partnership of environmental agencies, utilities, and nonprofit organizations that assist, recognize and promote businesses that volunteer to operate in a more environmentally responsible manner. To be certified "green," participants must be in compliance with all regulations and meet program standards for conserving water and energy, preventing pollution, and minimizing waste. The City became a participant in the program in 2006. It is coordinated through the City Public Works Department.



Businesses must meet a set of indoor and outdoor water conservation standards as part of achieving their Green Business Certification. All businesses are required to meet basic, mandatory measures (i.e. low consumption fixtures and fittings) as well as a minimum number of elective requirements from several categories (e.g. cleaning, landscape irrigation). Customers are also required to meet additional measures specific to their type of business (i.e. low flow spray rinse valves for restaurants).

A Water Conservation Representative meets with Green Business applicants and inspects the site's water using apparatuses, checks for leaks, discusses the water meter, and interviews the applicants to determine if the water conservation measures have been met. When needed, customers are provided with water saving devices and rebate application information to meet compliance with the Green Business standards. Businesses who do not meet the requirements during the initial inspection receive follow up inspections once they have implemented necessary changes.

The Water Conservation Office has conducted 129 commercial water audits as part of the program, including a diverse list of businesses ranging from auto repair establishments, office buildings, hotels, restaurants, and hospitality services, medical facilities, retail outlets, construction companies, churches, landscape contractors, and Laundromats.

City-administered Rebates The City offers similar rebates for commercial customers as it does for residential customers. These include rebates for high efficiency flush valve toilets and urinals or waterless urinals.

Plumbing Fixture Retrofit Regulations The City's retrofit regulations described above apply to commercial and industrial property in addition to residential property, and any older toilets, showerheads, and urinals are required to be replaced with low consumption fixtures and fittings at the time of sale. Although commercial properties do not turn over at the same rate as do residential properties, over time this ordinance has triggered the complete retrofit of some of the largest commercial properties in the water service area, including Chaminade Resort & Spa, the Dream Inn, and the University Inn and Conference Center, as well as numerous smaller commercial buildings.

The City has operated other commercial water conservation programs in the past which have been completed and are no longer active. In 2005 the City facilitated an energy and water saving project carried out by Ecology Action that replaced existing kitchen spray valves in local restaurants, cafeterias, and food service facilities with new high performance spray valves. The City also participated in a statewide program known as *LightWash* to promote high efficiency clothes washers to institutional and multi-family customers with common area laundry facilities, commercial Laundromats, and other businesses with on-site laundry facilities from 2003 to 2005.

As mentioned early in this chapter, the City has in the past also distributed free bed linen/bathroom water conservation cards to all local hotels, and drinking water upon request table tents to all local restaurants, and continues to make them available upon request.



## 6.8 Landscape Programs

### 6.8.1 Water Efficient Landscape Ordinance

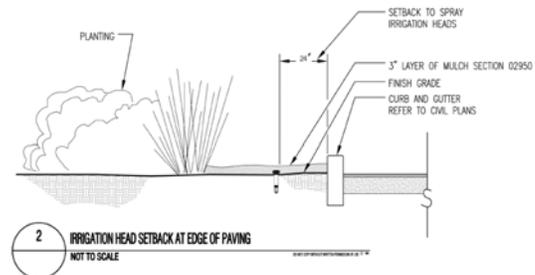
The City of Santa Cruz first adopted an ordinance establishing landscape water conservation regulations for major development projects situated in the City's service area in 1993 ([Santa Cruz Municipal Code Chapter 16.16](#)). The ordinance was rewritten in 2001, and revised again in 2010 in response to AB 1881, the Water Conservation in Landscaping Act of 2006. Its overall purpose is to ensure that the City's limited water supply is used efficiently and effectively in new landscapes within the City's water service area and to avoid certain landscape and irrigation design aspects that have the

potential to result in water waste. During the most recent revision, the City led an inter-agency effort to promote a regional framework and consistent standards among the various land use jurisdictions and public water suppliers within Santa Cruz County.

The City’s ordinance applies throughout the entire water service area as a condition of receiving water service. It covers all new and renovated, commercial, industrial, and public projects, new single-family and multifamily development projects resulting in three or more dwelling units where: 1) the landscape is installed by the developer, and 2) the total landscape area of the project is 2,500 square feet or more, and new single family and two-unit residential development projects on properties equal to or larger than 10,000 square feet. Certain provisions also apply to pre-existing landscapes over one acre in size. The ordinance contains provisions for:

- Dedicated irrigation meters for new landscapes or expansion of existing landscapes over 5,000 square feet in area;
- Landscape water budget based on 70 percent of reference evapotranspiration;
- Limits on the portion of the landscape devoted to turf and other water intensive uses; avoiding use of turf in narrow and sloping areas.
- Requiring very low to moderate water using plant materials, grouping plants with similar water needs
- Irrigation design to avoid conditions that lead to runoff and overspray
- Appropriate irrigation equipment, including requiring weather-based irrigation controllers to maximize water efficiency
- Soil preparation and mulching
- Storm water management
- Alternative water sources

*Landscape and irrigation plans are checked to ensure water efficiency in new development*



A complete landscape plan must be submitted and found to satisfy the standards before a building permit can be issued. Water Conservation staff reviews the landscape plans for compliance with the ordinance, coordinates plan review with Water Engineering and other City Departments and jurisdictions, and once installed, performs final inspections of the completed landscape. The largest project to come under the City’s landscape plan review process was the recent Highway 1/17 interchange landscaping. Other recent projects have included the live-work development at 2120 Delaware Avenue, Safeway renovation on Mission Street, and Tannery Arts complex on River Street.

## 6.8.2 Large Landscape Water Budgets

In July, 2010, the City launched a new program for customers with large landscapes and dedicated irrigation accounts. After converting all dedicated irrigation accounts to monthly meter reading, the City contracted with a consultant, WaterFluence LLC, to map landscape areas using aerial imagery, to develop irrigation budgets for the City's 110 largest irrigation customers, and to distribute the information through monthly Landscape Water Use Reports. The reports provide a site-specific irrigation budget based on landscape size and plantings, type of irrigation, and real-time local weather conditions that is obtained from the [CIMIS station](#) located at the DeLaveaga golf course. Customers receive monthly reports via mail or email comparing their actual consumption to the irrigation budget over a three-year period. The reports convert water use over budget into a dollar figure so that customers see how much money was lost to inefficient irrigation practices over various time intervals (previous month, previous year, etc). These reports are sent to the water customer as well as those with a vested interest in the property such as the landscape contractor, HOA Board Members, and Property Managers. Appendix N includes an example of a public site receiving a Water Use Report, the aerial imagery used to measure its landscaped area to develop the water budget, and a map of the service area showing the location of all properties where budgets have been developed.

In 2011, additional irrigation accounts and selected large CII and multifamily residential properties with mixed meters were added to the program. The expanded program now covers a total of 181 individual sites, 235 accounts, and over 14.1 million square feet of landscaping. Properties include parks, golf courses, hotels, schools, commercial lots, homeowner associations, government facilities, multi-family residential common areas, industrial properties, and medical facilities. Total water consumption for the accounts under active management exceeds 200 million gallons per year, some 6 percent of the system total.

As part of this program, a professional irrigation audit service is made available to large landscape customers through the contract with WaterFluence. The audits include an assessment of irrigation efficiency, notation of irrigation issues (scheduling, tilted nozzles, leaks, breaks, pressure, overspray etc.), and a confirmation of the landscape area measurements. Customers receive a detailed report with site photos noting irrigation problems, a sprinkler condition analysis, cost-

*Large landscapes and parks offer open spaces for community use and recreation*



effective recommendations, scheduling suggestions, and a list of water management essentials.

The Water Conservation Office selected properties for this program based on annual water consumption, landscape size, previous history of water waste and/or water restrictions violations, and recommendations from local landscape contractors. After initial program implementation, staff conducted an informal marketing campaign and met with local landscape contractors, property managers, and parks staff to raise awareness of the program's value, encourage active participation, and solicit irrigation audits. Water Conservation Staff maintains contact information records and actively seeks to increase report distribution to relevant parties. The site mapping, water budget calculations, report distribution, and professional water audits are managed by the consultant. Data to calculate water savings and analyze trends will be available at the end of 2011, when a full year's data is available.

### **6.8.3 Turf Removal Rebate**

The Water Conservation Office has just begun offering a rebate program to promote turf removal to encourage and expand landscape water conservation opportunities for customers and to provide an option for customers seeking to mitigate high utility bills.

The rebate offer is \$0.50 per square foot of lawn removed. This amount is comparable to other rebate programs the City offers, in terms of dollars per avoided gallon per day of water use, and in line with what other water utilities that offer this type of program commonly pay. Single-family customers are eligible to receive up to a \$250 rebate (equal to 500 square feet) and multi-family and commercial customers may receive up to \$1,000 (equal to 2,000 square feet). To qualify, customers must:

- Have green lawn that is watered with an in-ground irrigation system,
- Remove or cap their overhead spray system in the area to be converted,
- Replace lawn with very low or low water use plants and mulch (with or without low volume drip irrigation) or install no water use permeable hardscape options,
- Agree to pre and post inspections to take measurements and ensure eligibility requirements have been met, and
- Complete the landscape conversion within 120 days of pre-approval.

Lawn removal rebates will be marketed to water customers, landscape contractors, and property managers. The program will be evaluated after one year and examine its effectiveness and to reconsider the rebate amount and program parameters.

## 6.9 Other Water Conservation Initiatives

The City has been active in implementing other water conservation measures beyond the BMPs listed in the MOU and the programs identified in the Long-Term Water Conservation Plan. These include a Rain Barrel program and leading an effort to facilitate graywater use in the City.

On a trial basis, the City operated a subsidized rain barrel distribution program during the 2010 winter season. The goals of this pilot program were to promote consumer education about various methods to conserve water in their landscape, to complement other outdoor water saving measures the City promotes, to develop information about consumer interest and satisfaction with rain harvesting systems, and, as secondary objective, to help the City meet its environmental stewardship goals and storm water management requirements.

The Water Conservation Office purchased two shipments of 65-gallon [MOBY](#) rain barrels and made them available at a reduced cost to City water customers. A display model was set up in the customer service lobby, where interested customers could purchase one or more barrels at the Customer Service counter. Water Distribution personnel delivered the barrels. Barrel placement and installation was the responsibility of the consumer. This program was very popular with the public. Almost 200 barrels were quickly sold and a waiting list generated. The program will be offered again in the 2011 winter season.

*Rain barrels proved to be a popular item with City water customers*



The City also amended its Sewer System Ordinance ([Santa Cruz Municipal Code Chapter 16.08](#)) in 2011 to enable gray water systems to be constructed and operated in the City in conformance with Chapter 16A of the California Plumbing Code. Previously, City ordinance prohibited discharge of wastewater to other than the public sewer. The amended ordinance now allows residents to legally build a “Laundry to Landscape” type graywater system without a permit, and for other types of graywater systems to be developed, consistent with the Plumbing Code, with appropriate permits and oversight<sup>4</sup>.

<sup>4</sup> The City does require an Installation and Maintenance Agreement to ensure notification of the location of Laundry to Landscape systems is given to the City and graywater users abide by certain guidelines.

## 6.10 Schedule of Implementation

Water Code Section 10631f(2) requires water suppliers to

*“Provide a schedule of implementation for all water demand management measures proposed or described under the plan.”*

Table 6-4 below summarizes the year each program was originally implemented and the status of all the demand management measures. Except in cases where certain projects were completed or specific programs ended as noted in the foregoing descriptions, all programs are currently active and ongoing. Where two or more years are noted, it means a major addition or modification was made to the program.

**Table 6-4. Demand Management Measure Implementation Schedule and Status**

BMP #	DMM	BMP Name	Year Implemented	Status
1.1.1	L	Conservation Coordinator	1986	Ongoing
1.1.2	M	Water Waste Prevention	1981	Ongoing
1.1.3	J	Wholesale Agency Programs	Not applicable	
1.2	C	Water Loss Control	1997	Ongoing
1.3	D	Metering w/ Commodity Rates	--	Ongoing
1.4	K	Retail Conservation Pricing	1995, 2004	Ongoing
2.1	G	Public Information Programs	1986	Ongoing
2.2	H	School Education Programs	1986	Ongoing
3.1	A,B	Residential Assistance	2001	Ongoing
3.2	A	Landscape Water Survey	2006	Ongoing
3.3	F	High Efficiency Clothes Washer Program	2000	Ongoing
3.4	N	WaterSense Specification Toilets	1995, 2003, 2010	Ongoing
4	I	CII programs	2001, 2007	Ongoing
5	E	Landscape	1993, 2001,2010	Ongoing

## 6.11 Methods to Evaluate Effectiveness

Water Code Section 10631f(3) requires water suppliers to

*“Provide a description of the methods, if any, that the water supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.”*

A variety of methods are used to evaluate the effectiveness of the water conservation programs. These methods include customer participation and satisfaction surveys, data analysis (both in-house and by consultants), tracking water consumption (in categorical classes and/or individual accounts participating in a program), annual reports, and materials review and updates. The methods used to evaluate effectiveness for each demand management measure are summarized in Table 6-5 below.

**Table 6-5. Methods Used to Evaluate Effectiveness**

BMP #	DMM	BMP Name	Surveys	Data Analysis	Track Consumption	Annual Reports	Material Review	Not Applicable
1.1.1	L	Conservation Coordinator						✓
1.1.2	M	Water Waste Prevention	✓	✓				
1.1.3	J	Wholesale Agency Programs						✓
1.2	C	Water Loss Control		✓	✓	✓		
1.3	D	Metering w/ Commodity Rates						✓
1.4	K	Retail Conservation Pricing		✓	✓	✓		
2.1	G	Public Information Programs					✓	
2.2	H	School Education Programs					✓	
3.1	A,B	Residential Assistance	✓	✓			✓	
3.2	A	Landscape Water Survey	✓	✓	✓	✓		
3.3	F	High Efficiency Clothes Washer Program	✓	✓	✓			
3.4	N	WaterSense Specification Toilets	✓	✓	✓			
4	I	CII programs	✓	✓	✓			
5	E	Landscape	✓	✓	✓	✓		

## 6.12 Estimated Water Conservation Savings

Water Code Section 10631f(4) requires water suppliers to

*“Provide an estimate, if available, of existing conservation savings on water use within the supplier’s service area and the effect of savings on the supplier’s ability to further reduce water demand”.*

Table 6-6 below provides an estimate of long-term water conservation savings achieved via the various programs for which the City quantifies results.

**Table 6-6. Estimated Conservation Savings by Program (million gallons per year)**

Sector/Program Name	Prior to 2006	2006-2010	Cumulative Savings
Residential:			
• Home Water Survey	--	9.1	9.1
• Conservation Kit Distribution	18.7	--	18.7
• Toilet Rebate	65.3	20.4	85.7
• Plumbing Fixture Retrofit	26.4	19.1	45.5
• Clothes Washer Rebate	18.8	23.3	42.1
CII:			
• Pre-Rinse Spray Valve	10.6	0.8	11.1
• Toilet Rebate	3.8	3.2	7.0
• Plumbing Fixture Retrofit	1.9	3.0	4.9
• Clothes Washer Rebate/LightWash	1.7	0.8	2.5
• Green Business	--	0.7	0.7
• Smart Rebate	--	8.9	8.9
Landscape:		<i>Pending analysis</i>	
• Large Landscape Water Budget	--		--
• Water Efficient Landscape Ordinance	11.2	3.3	14.5
<b>Total</b>	<b>158.4</b>	<b>92.6</b>	<b>251.0</b>

In addition, as mentioned in section 6.4.4.1 very significant water savings, on the order of 400 million gallons per year was achieved over the 2005-2008 period that was strongly related to the combined impact from the implementation of a five-tier structure and the sharply higher rates for water service. The extent to which programmatic water savings over the past five years overlaps with rate-related demand reduction at the same time is not known and cannot be isolated. It should also be noted that additional short-term water savings on the order of 300 million gallons per year was achieved through water restrictions imposed in 2009 due to water shortage. Together, these different factors account for the downturn in overall water consumption of almost 900 million gallons per year and 26 percent decrease in per capita water use since over the past decade discussed in Chapter 4.

The question of what effect water savings already achieved will have on the City's ability to further reduce water use is unclear. The City's Long-Term Water Conservation Plan was intended to target mainly indoor plumbing fixtures and appliances, which it did. The declining rate of water savings in toilet replacement programs (and overall savings) over time suggests that the residential and commercial market may be moving toward the saturation point, after which future savings due to ongoing replacement with the next generation of high efficiency toilets will be substantially diminished. In certain sectors, such as hotels for example, it is known that most buildings in the service area are

already completely retrofit. On the other hand, the extent to which high efficiency clothes washers have made inroads in the residential sector is probably far less than toilets and the technology continues to improve. This is one major end use of water where substantial water conservation savings likely exists.

The degree to which water savings already achieved will reduce the City's ability to obtain short-term water savings during a shortage is also unclear. The distinction between the City's long-term water conservation efforts and short-term curtailment is covered in Chapter 5. The experience of 2009 suggests that short term cutbacks can still be achieved through restrictions on outdoor watering at relatively low cost and sacrifice by the customer, up to a point. However, water shortage events can also induce customers making long-term changes that then are no longer available in future shortages. This is an area of concern that is voiced by many City business customers who have already made substantial and costly efforts over time to ensure their operations are water efficient and are leery that they could be punished in some future shortage by having to curtail their use even more. Moreover, as City's water conservation program shifts more towards outdoor water use, opportunities to cutback may gradually decline.

### **6.13 Quantifying Remaining Water Conservation Potential**

To help address these questions and to help plan for the future, the City has engaged a consultant to carry out a Residential and Commercial Water Use Baseline Survey. The goal of this project is to develop an accurate estimate of the current saturation or market penetration of water-conserving fixtures, devices, equipment, and features within residential and commercial properties, to take stock of existing conditions, and to assess progress following implementation of the Long-Term Water Conservation Plan. It involves obtaining various property owners' consent to perform a physical inspection and take inventory of indoor and outdoor water-using equipment at a sample of randomly selected properties within the residential and CII sectors. This project is expected to be complete in early 2012.

The data acquired through this Baseline Survey project will then inform a separate, technical analysis of possible water-saving technologies, programs, and services that will reduce future water demand, and their associated costs, to identify remaining long-term water conservation potential across the service area and to fashion a similar water conservation plan for the City for the next ten-year period. The project is scheduled to begin in early 2012. When completed, the Water Conservation Plan will provide a long range road map for future, and further, water efficiency efforts. The results will be use to

help inform the City's water demand projections and will be factored into overall water supply planning efforts.

One of the concerns voiced by the public in the review of this document was the role that water conservation might play in tempering ongoing growth in water demand forecast between 2010 and 2030, and the relationship between the city's system development charges and water conservation that is intended to compensate for the impact of new water demands on the system.

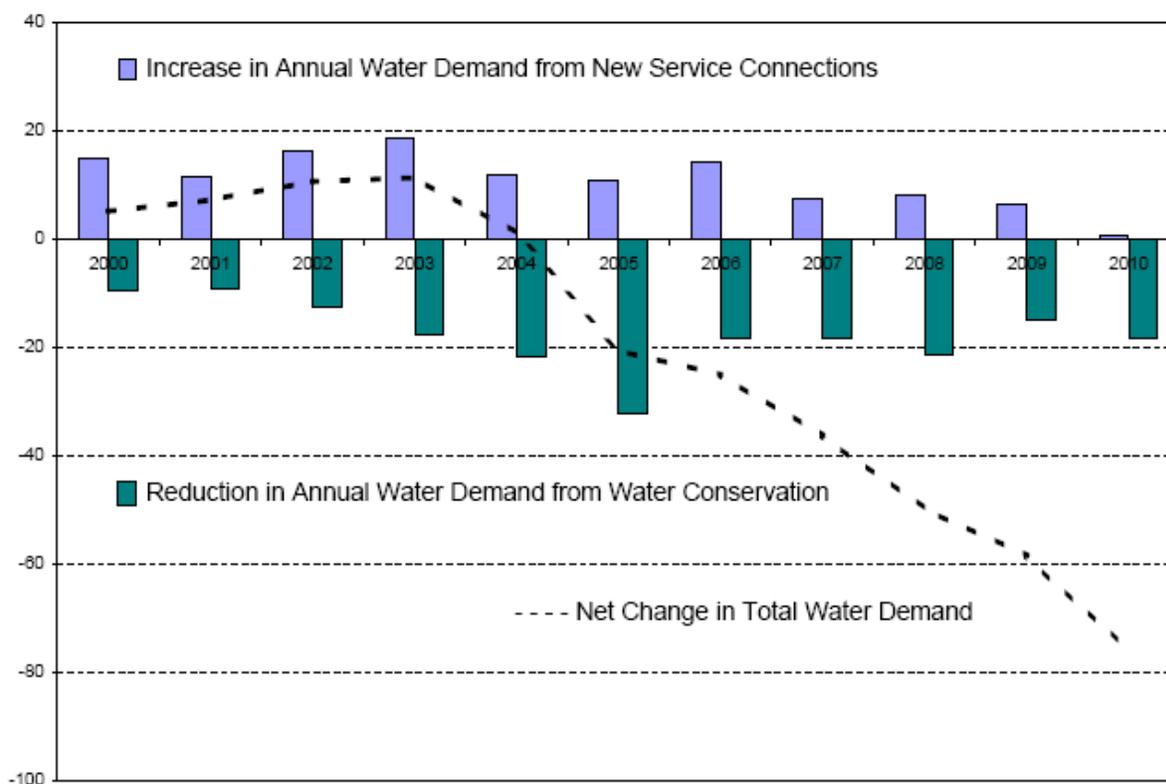
As mentioned in section 6.1, the City's water conservation program is funded by a combination of water rates, system development charges, and miscellaneous service fees. The collection and use of system development charges is set forth in [Section 16.04.041](#) of the Santa Cruz Municipal Code. This charge is collected on any new connections and upon expansion of water service for existing connections, and are held in a separate and special fund (715). These revenues are used exclusively for the following purposes:

1. To pay for the City's future construction of facilities or to reimburse the water fund for those described or listed facilities constructed by the water fund with funds advanced to the water fund from other sources, or
2. To reimburse developers who have been required or permitted to install such listed facilities which are oversized with supplemental size, length, or capacity beyond that needed for the certain development and are subject to the terms of a reimbursement agreement with the city,
3. To pay for water conservation programs which have the net effect of increasing the amount of water supply available for allocation to new connections.

With regard to water conservation, revenues from system development charges are used primarily for various rebate programs, including residential and commercial toilets, urinals, clothes washers, Smart Rebates, and more recently, lawn removal rebates, which account for the majority of long-term water savings generated each year. The amount collected annually from system development charges has always been adequate to fully fund water conservation programs, and has never presented a barrier to program implementation.

A comparison of annual growth in water demand attributable to new connections over the last decade with the reduction in water demand accomplished through water conservation savings is provided in Figure 6-1.

**Figure 6-1. Impact of Water Conservation on Mitigating Growth in Water Demand from New Water Service Connections, 2000-2010**



As the chart shows, there has been larger reduction in water use from water conservation programs than there has been an increase in water use by new connections, with a net decrease over the last ten years of almost 80 million gallons per year<sup>5</sup>. This fact demonstrates that the City’s approach of using system development charges to help fund long-term water conservation programs has been successful in compensating for the impacts of new water demands on the system in recent years. How long this trend may hold into the future, though, is uncertain and depends on both the rate/type of new development and remaining long-term water conservation potential going forward.

In the meantime, the City will continue to implement BMPs as outlined in the MOU and to pursue new opportunities and methods to maximize water use efficiency throughout the City for the foreseeable future.

<sup>5</sup>Data on annual water demand for new connections established in calendar year 2010 is incomplete and will be available in 2012